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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LESPERANCE, JEAN E

ART UNIT

PAPER NUMBER

2674

DATE MAILED: 08/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/611,541

Applicant(s)

FERGASON, JAMES L.

Examiner

Jean E Lesperance

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-11 and 14-38 are rejected under 35 U.S.C. 102 (e) as being unpatentable over U.S. Patent # 6,184,969 ("Ferguson").

As for claim 1, Ferguson teaches a computer control 905 that can operate the display 903 in sequential manner to produce multiple images in sequence while the display is being illuminated by only a single light source or color of light (column 52, lines 28-31) corresponding to a display system comprising multiple display generators and this can be accomplished by adding an additional lens 717 or other optical system between the beam splitter 722 and the eye 713 (column 49, lines 53-55) corresponding

to a beam splitter to combine images from the display generators to enhance performance by direct view.

As for claim 2, Ferguson teaches a display 2 that may be an LCD, a flat panel display or other display (column 13, lines 5-7) corresponding to the display generators are flat panel LCDs.

As for claim 3, Ferguson teaches an image 520a that is at 45 degree angle to the optic axis 512' of the quarter wave plate 512 (column 30, lines 52-54) corresponding to the LCDs are identical and the polarization of the LCDs are at 45 degrees to the horizontal, whereby an image from one LCD transmitted through the beam splitter for viewing and the image from the other LCD which is reflected from the beam splitter will have linear polarization at right angles.

As for claim 4, Ferguson teaches a left eye image to the left eye 82 and a right eye image to the right eye 83 (column 20, lines 11-13) corresponding to the polarizers are used to separate the images for right and left eye.

As for claim 5, Ferguson teaches a single lens element of the auto-stereoscopic display (Fig.9) corresponding to the polarizers are polarized lenses in eyeglass frames.

As for claims 6-8, Ferguson teaches a quarter wave plate having its optic axis aligned at 45 degrees to the plane of polarization of incident plane polarized light converts the plane polarized light to circular polarized light (column 33, lines 20-31) corresponding to the polarization is modified by adding quarter wave plates, respectively, to the light paths from the LCDs so that the output light is separated by right and left circular polarized light.

As for claim 9, Ferguson teaches the light enters at the right angle to the face 32 (column 15, lines 48-49) corresponding to the display generators are disposed at right angles and are in the vertical planes.

As for claim 10, Ferguson teaches a circularly polarized light can mathematically be resolved into equal amplitudes of vertical and horizontal plane polarization separated in phase by 90 degrees (column 29, lines 36-38) corresponding to the display generator for direct viewing through the beam splitter is in the vertical plane and the display generator that is reflected in the beam splitter is in the horizontal plane.

As for claims 11, 14 and 15, Ferguson teaches an electro optical dithering to obtain three dimensional images, especially using auto-stereoscopic effect (column 7, lines 43-45) corresponding to the stereo signal is received as a stereo pair and the display generator directly viewed through the beam splitter is in the vertical plane and is scanned from top to bottom and the display generator that is reflected by the beam splitter in the horizontal plane and is scanned from bottom top; a first one raster or set of lines that is scanned to cause one sub frame (column 4, lines 2-3).

As for claims 16-18, Ferguson teaches the RGB colors that can be changed to give a candlelight or moonlight effect with good resolution (column 7, lines 34-36) corresponding the display generators are made up of red green and blue color sub pixels to form picture elements and/or arranged to overlay each other so as to minimize color halos and color fringes.

As for claim 19, Ferguson teaches an axis that is parallel or perpendicular to the plane of polarization (column 17, lines 5-7) corresponding to a mount to position the display generators relative to each other in perpendicular planes.

As for claims 20-22, Ferguson teaches a plurality of corner cubes (column 47, line 12) corresponding to mount including a cubical structure, the beam splitter being in the cubical structure and the cubical structure having open areas receiving light from the respective image generators and passing such light to the beam splitter.

As for claim 25, Ferguson teaches a display that produces a nonpolarized light output (Fig.25) corresponding to cover portions being operable to permit arrangement of the display generators in perpendicular planes with the beam splitter therebetween.

As for claim 26, Ferguson teaches a passive dithering system used in connection with the display, which produces a polarized output (Fig.23) corresponding to a cover portions being operable to permit arrangement of the display generators in parallel relation in a common plane.

As for claims 27 and 28, Ferguson teaches a computer control 905 that can take the integral of the data line electrically or an integral of the whole set of data or all of the pixels while electrically skipping the blanking (column 52, lines 62-66) corresponding to a data processing system including a processor, a memory and connections to the respective display generators.

As for claim 29, Ferguson teaches an image signal source 906 that may be a source of computer graphics signals or other signals intended to produce an image on the display (column 52, lines 20-23) corresponding to an operating software to invert the

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data for presentation to one of the display generators for displaying the data in inverted relation to the data displayed by the other display generator. It is inherent that the computer graphics has software that can invert the data for presentation.

As for claims 23, 24 and 30, Ferguson teaches a viewing system that may be part of a virtual reality viewing system having one or more displays which are viewed by the person (column 42, lines 19-21) corresponding to a pair of displays, a beam splitter (722), the optical components include focusing optics 721, a beam splitter (722) and one or more retro reflectors 23, 23' (column 43, lines 14-17) corresponding to a package containing the displays and beam splitter, the initial image 534a is doubled in the vertical direction and then the initial image and the doubled image are doubled in the horizontal direction to produce four adjacent images which may substantially cover the portion of the original pixel 534a in the display and dead space surrounding the pixel in one vertical and horizontal direction (column 34, lines 41-47) corresponding to a package including a pair of cover portions and a hinge connecting the cover portions allowing the cover portions to be closed to contained in protected closed relation the displays and beam splitter, and right eye, left eye imaging and depth perception are techniques used in some stereoscopic imaging and viewing systems which are commercially available corresponding to the displays and beam splitter in respective operative relation to present stereoscopic images for viewing.

As for claim 31, Ferguson teaches a retro-reflector 723 that is part of a conjugate optics path 823a in which light incident thereon is reflected in the same path and opposite direction as reflected light. The beam splitter 722 directs light from the

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focusing optics 721 into that conjugate optics path and toward the retro-reflector; and the beam splitter also passes light in the conjugate optics path from the retro-reflector in the output port 16 for viewing by the eye 713 (column 47, lines 45-52) corresponding to simultaneously displaying a left image on a display and a right image on another display, and combining those images in a common light path.

As for claim 33, Ferguson teaches a shifting of pixel images vertically to form the four pixel images ba" places some of those in the gaps between rows of pixels and some in superimposed relation in the same and/or other pixels or shifted pixel images (column 42, lines 13-16) corresponding to the images are color images, each being composed of an assemblage of lines of different respective colors, and wherein the color image from one display is an arrangement in a one sequence and the color image from the other display is in an arrangement in the opposite sequence.

As for claim 34, Ferguson teaches a stereoscopic effect viewing that is obtained when the control system 905 operates the display systems 961, 962 to provide, respectively, right eye and left eye images that are sufficiently distinct to provide depth perception. Right eye, left eye imaging and depth perception are techniques used in some stereoscopic imaging and viewing system which are commercially available 9column 55, lines 4-10) corresponding to presenting a left eye image on an image generator, presenting a right eye image on another image generator, combining in a substantially common light path the respective images.

As for claims 32 and 35, Ferguson teaches an analyzer 12' that may be a linear polarizer or some other device which can discriminate between the characteristics of

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light incident therein, such as the direction of plane of polarization, circular polarization, etc. (column 18, lines 13-16) corresponding to discriminating between the left eye image and right eye image for viewing by respective left and right eyes the respective left and right eye images from the light in the common light path.

As for claim 36, Ferguson teaches inverting the image data for one of the images for presenting for viewing in substantially superposed relation to the other eye image.

As for claims 37 and 38, Ferguson teaches a second calcite crystal 689, which can transmit the incident pixel image (column 41, lines 63-65) and the projection lens 720 projects light toward the retro-reflector 723 to cause a real image to be formed at the retro-reflector (column 47, lines 28-30) corresponding to a beam splitter to combine the images by transmitting one image and reflecting the other image.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12, 13, 39, and 40 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent # 6,184,969 ("Ferguson") in view of U.S. Patent # 3,777,059 ("Wilkey, Jr.").

As for claims 12, 13, 39, and 40, Ferguson teaches a display that is operated at a reflective mode (column 7, line 2) corresponding to the image signal for the reflected display generator. Accordingly, Ferguson teaches all the claimed limitations as recited

in claims 12, 13, 39, and 40 with the exception of providing inverting from top to bottom; from left to right.

However, Wilkey, Jr. teaches a display that has its top line at the bottom of the display with the characters formed in mirror image, inverted and the first character of the line appearing at the left hand side of the line (column 1, lines 42-45). The characters forming lines 12b are likewise formed in mirror image from right to left, but are inverted so that the first character of each line appears at the left hand side (column 3, lines 35-38).

It would have been obvious to utilize the inverted characters as taught by Wilkey, Jr. in the optical display disclosed by Ferguson because this would eliminate the ambient light reflections as usually occur on the display face.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean Lesperance whose telephone number is (703) 308-6413. The examiner can normally be reached on from Monday to Friday between 8:00AM and 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe, can be reached on (703) 305-4709.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

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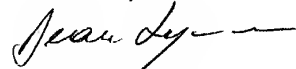
or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Jean Lesperance



Date 8-24-2002

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RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600